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Original Article

Peer review and audit of morbidity after three or more caesarean sections

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الملخص

أهداف البحث: استعراض لنتائج الأم والمواليد بعد العملية القيصرية الثالثة وما بعدها بين سجلات ستة أطباء نواب للتوليد. وكانت النتائج الرئيسة التي درست هي مراضة الأم، وماينتج من مضاعفات أثناء الجراحة وبعدها للأم وكذلك للمواليد.

طرق البحث: أجريت دراسة استعادية على النساء اللاتي خضعن سابقا لاثنين أو أكثر من العمليات القيصرية، والمسجلين ضمن سجلات ستة أطباء نواب للتوليد بالمستشفى التعليمي المرجعي بجامعة السلطان قابوس في سلطنة عمان. وقد تم جمع البيانات بأثر رجعي من السجلات الصحية الإلكترونية لـ 120 امرأة عمانية ما بين يناير 2010م، وديسمبر 2011م، أي بمعني 20 امرأة من كل سجل.

النتائج: تم تسجيل النزف لأكثر من 1000 مل عند 10٪ من المرضى، وأصيبت مثانة مريضة واحدة أثناء الجراحة، وحدثت عدوى للجرح بعد العملية عند 5٪ من المرضى. وسجلت صعوبة في فتح البطن عند مريضة واحدة، وأصيبت مريضة واحدة بجلطة في الأوردة العميقة بالساق رغم حصولها على الهيبارين وقائيا. كان واحد من المواليد خديجا، بينما كان أربعة من المواليد نموهم متعثرا داخل الرحم. بالنسبة للمضاعفات أثناء الجراحة مثل فقدان الدم، وإصابة الأحشاء، ومتوسط زمن العملية القيصرية، ومضاعفات ما بعد الجراحة، مثل جلطة الأوردة العميقة بالساق، وعدوى الجرح وارتفاع درجة الحرارة، فكانت متقاربة بين المسجلين بالسجلات الستة.

الاستنتاجات: مستوى الأطباء النواب متقارب حسب المعايير الدولية.

الكلمات المفتاحية: عملية قيصرية; مراجعة الأنداد; المراجعة; المراضة; الطبيب النائب

Abstract

Objective: A review of maternal and newborn outcomes after a third or more caesarean section was conducted among six obstetrician registrars. The main outcome measures were maternal morbidity, intraoperative and postoperative complications and neonatal outcome.

Methods: A retrospective cohort study was conducted of caesarean sections for women who had previously undergone two or more caesarean section performed by six obstetrician registrars in Sultan Qaboos University Hospital, a tertiary referral hospital in Oman. Retrospective data were collected from electronic health records of 120 Omani women between January 2010 and December 2011 (20 per registrar).

Results: Haemorrhage of more than 1000 ml was recorded in 10% of patients, one patient was found to have a bladder injury intraoperatively, and postoperative wound infection occurred in 5% of patients. Difficulty in opening the abdomen was found in one patient, and one case of deep vein thrombosis occurred despite prophylactic heparinisation. One infant was preterm, and four had intrauterine growth restriction. Intraoperative complications, such as blood loss, visceral injury and long mean operating time and postoperative complications, such as deep vein thrombosis, wound infection and febrile morbidity, were comparable among the registrars.

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Conclusion: The standard of the registrars was comparable, and similar to international standards.

Keywords: Audit; Caesarean section; Morbidity; Peer review; Registrar

Introduction

Caesarean section is the commonest operative procedure in obstetrics. Serious maternal morbidity increases progressively with an increasing number of caesarean deliveries, especially placenta praevia and accreta.[1] The major types of maternal morbidity and mortality in women with multiple caesarean sections were reported by Silver et al.[1] to be placenta accreta and hysterectomy. Even in the absence of placenta praevia or accreta, women undergoing multiple repeated caesarean deliveries were reported to be at risk for surgical morbidity, including blood loss requiring four units or more, cystotomy, bowel injury, ureteral injury, ileus, requirement for postoperative ventilation, admission to intensive care, long operating time and long hospitalisation. Morbidity increased with an increasing number of caesarean deliveries. Silver et al. studied 8123 women who underwent more than two caesarean sections, making it the largest study to date.

Few studies have directly assessed the risk associated with repeated caesarean deliveries, and those apart from that of Silver et al. involved relatively few women.[2,3] A few studies are available on bladder injuries during caesarean section or on maternal and newborn outcomes after multiple caesarean sections.[4–6] A peer review audit on justification and indications for caesarean section was conducted for 50 consecutive interventions and published in 1993.[7] As, to the best of our knowledge, no peer review of obstetricians performing caesarean sections has been reported, we conducted a hospital peer review.

Materials and Methods

We compared maternal and newborn complications for women who had two or more caesarean sections in the services of six senior registrars. The primary sections were usually performed by junior staff (senior house officers) and were not included. The peer review was approved by the institutional ethics committee. A total of 120 patients who had a caesarean section for the third time or more between January 2009 and December 2012 were included, representing 20 per registrar. The following information was collected from the electronic records of the patients:

- number of previous caesarean sections
- elective or emergency surgery
- duration of surgery
- intraoperative complications
- estimated blood loss
- preoperative and postoperative haemoglobin
- postoperative complications
- length of hospital stay
- neonatal outcome

Some of the information had to be retrieved from anaesthesiology records.

Statistical analysis was carried out with IBM SPSS Statistics-19 for Windows. Appropriate charts were used to compare the results. One-way ANOVA was used to compare means if the pattern of the distribution was normal; otherwise, the Kruskal Wallis test was used. A p value ≤ 0.05 was considered significant.

Results

All the patients were Omanis of a mean age of 34.5 ± 4.05 years. The median gestation at delivery was 38 weeks, with a mean of 37.4 ± 1.6 weeks. None of the patients smoked.

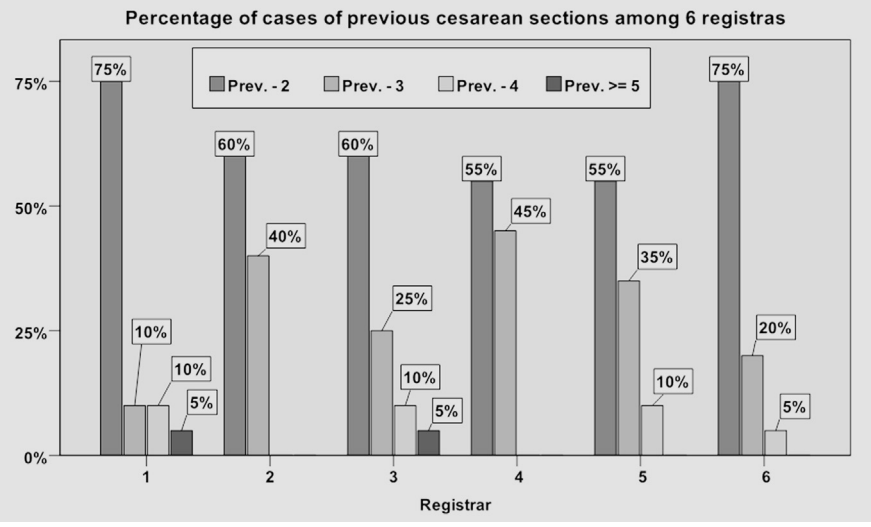

Figure 1: Percentage of cases of previous cesarean sections among six registrars.

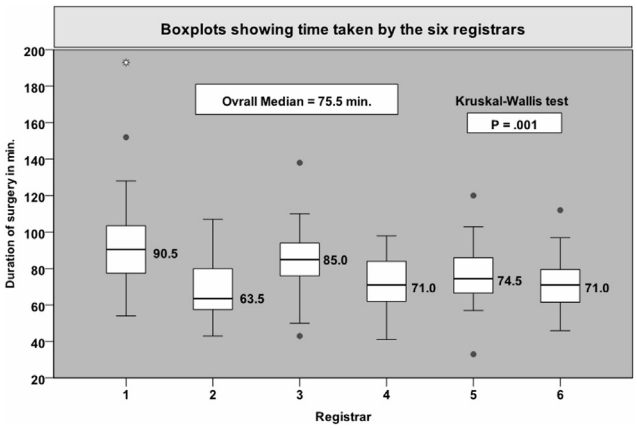

Figure 2: Box plots showing time taken by six registrars.

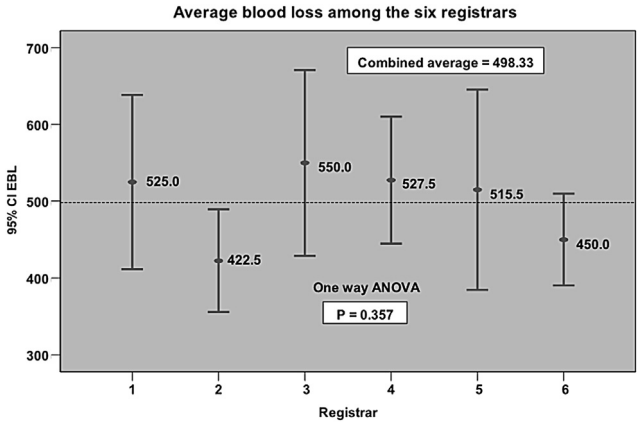

Figure 4: Average blood loss among the six registrars.

About 6% had sickle-cell disease, 10% had gestational diabetes, one had multiple sclerosis and one had thrombophilia. Patients with conditions such as placenta praevia and accreta were excluded, as they were treated by consultants.[8,9]

Haemorrhage of more than 1000 ml was recorded in 10% of patients, one patient was found to have a bladder injury intraoperatively, and 5% had postoperative wound infection. Atonia was the main reason for haemorrhage. Difficulty in opening the abdomen was found in one patient, and one case of deep vein thrombosis occurred despite prophylactic heparinisation. One infant was preterm, and four had intrauterine growth restriction.

Elective caesarean section accounted for 75% of the cases, the remainder being operated as emergencies. The number of previous caesarean sections among registrars was comparable (Figure 1). The median operating time was 75.5 min, with a statistically significant difference among registrars (Figure 2). Intraoperative complications such as haemorrhage occurred in two to three patients per registrar; bladder injury was found in only one patient (Figure 3). The average blood loss was 498 ml, with significant differences by registrar (Figure 4). The validity of the blood loss estimated by each registrar was comparable, as the average decrease in haemoglobin on day 2 after operation was comparable to the blood loss (Figure 5). The (culture-proven) wound infection rate was 4% overall, with a minimum of one patient for each registrar and a maximum of two. The mean length of hospital stay was more than 5 days for six patients, and only two patients required readmission, mainly for anaesthetic complications such as lung atelectasis. One patient had deep vein thrombosis despite low molecular mass heparin prophylaxis. One patient required re-laparotomy for a broad ligament haematoma diagnosed within 6 h of surgery.

The experience of the assistants was comparable among the registrars. The two registrars with the shortest operating time and the least blood loss had longer experience than the other four.

Neonatal outcomes were good for all the registrars. There were two neonatal deaths, one due to Edwards syndrome (diagnosed antenatally) and the other to pyruvate dehydrogenase deficiency. Four infants had intrauterine growth restriction, one had a cleft lip, and one was born preterm.

Discussion

The registrars were found to be comparable with respect to most aspects of morbidity, such as intraoperative blood

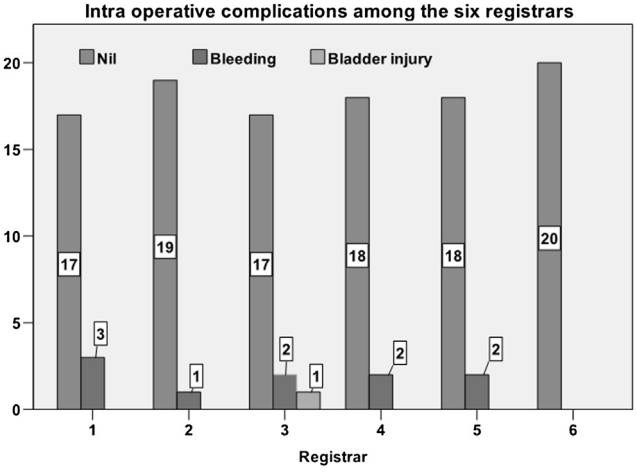

Figure 3: Intraoperative complications among the six registrars.

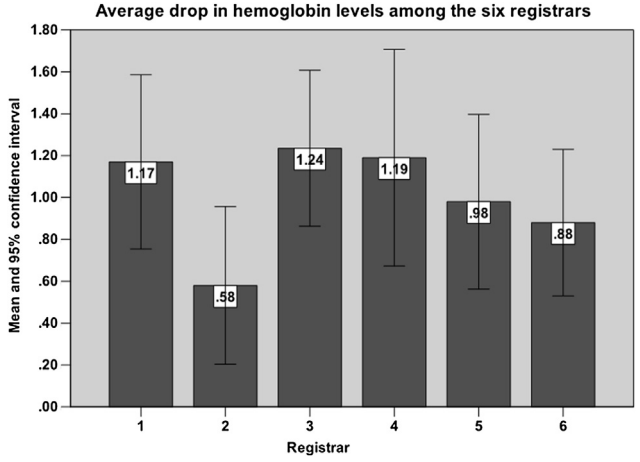

Figure 5: Average drop in haemoglobin among the six registrars.

Table 1: Comparison with two other studies of major morbidity after two or more caesarean sections.

	Silver et al.[1]	Sobande et al.[6]	Present study
No. of patients	8123/30 132	115	120
Intraoperative time (min)	67.9	Not reported	75.5
Blood loss (ml)	Not reported	436	498.3 ml
Fall in haemoglobin (gm/dl)	1.13	Not reported	1.06
Bladder injury (%)	0.09	1.7	0.008
Bowel injury (%)	0.001	0.86	0
Wound infection (%)	Not reported	3.4	5
Deep vein thrombosis (%)	Not reported	0.86	0.008
Length of hospital stay	Significant association	Not significant	Not significant

loss, visceral injury and postoperative morbidity. The estimated blood loss correlated well with the decrease in postoperative haemoglobin.

This is one of only a few reports on morbidity following multiple caesarean sections conducted as a peer review audit. The results may help to improve quality in the department. The limitations of the study are the size of the sample and its retrospective nature.

Comparisons with other studies with regard to post-caesarean morbidity are shown in Table 1. The mean blood loss, bladder injury rate and wound infection in our review are comparable to those of Sobande et al. in 2006.[6] The one case of deep vein thrombosis occurred despite adherence to local protocols for thromboprophylaxis; however, although the woman had a body mass index of 45, she was given the usual low-dose molecular mass heparin; an appropriate dose might have avoided the morbidity. One patient was returned to the operating room for a broad ligament haematoma. She had a caesarean section as an emergency while on low molecular mass heparin for previous deep vein thrombosis and protein S deficiency. Six patients had a hospital stay of 5 days or more, three because of lung atelectasis related to general anaesthesia and the other three for postoperative fever.

Two patients were readmitted, one for deep vein thrombosis and the second for wound infection. The second case was in a woman who had undergone her fifth caesarean section. The abdominal incision was sub-umbilical midline, with a difficult entry and an operating time of nearly 3 h because of adhesions. Of the five patients with culture-proven wound infection, three had a body mass index more than 35, one was overweight and the fifth was of normal weight.

In conclusion, the standard was comparable among registrars and was similar to international standards. Practical recommendations from this audit are to follow the correct protocol for thromboprophylaxis and to ensure better documentation in records, such as the start and end of the procedure, as some of the information had to be retrieved from anaesthesiology records. A similar peer review might be conducted among residents, with an assessment tool such as objective assessment of technical skills.[10]

Conflict of interest

The authors have no conflict of interest to declare.

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